



ALABAMA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

POST OFFICE BOX 301463 ♦ 1400 COLISEUM BLVD. 36110-2059

MONTGOMERY, ALABAMA 36130-1463

WWW.ADEM.STATE.AL.US

(334) 271-7700

JAMES W. WARR
DIRECTOR

DON SIEGELMAN
GOVERNOR

March 3, 1999

Facsimiles: (334)

Administration: 271-7950

Air: 279-3044

Land: 279-3050

Water: 279-3051

Groundwater: 270-5631

Field Operations: 272-8131

Laboratory: 277-6718

Education/Outreach: 213-4399

MEMORANDUM

TO: Gerald Hardy, Chief
Land Division

FROM: Joseph L. Gibson, Hydrogeologist
Groundwater Branch
Water division

RE: Preliminary Assessment - Groundwater
Center Star Manufacturing, Inc.
Oxford, Calhoun County, Alabama

The following groundwater report was prepared through a search of literature and information available to the Groundwater Branch. The author did not conduct a site visit.

LOCATION

Center Star Manufacturing Inc. is located in Oxford, Calhoun County, Alabama (Figure 1). The United States Geological Survey's (USGS) 7.5 Minute Quadrangle Map entitled Oxford, Alabama shows the location of the site to be in the northwest $\frac{1}{4}$ of the northwest $\frac{1}{4}$ of the southwest $\frac{1}{4}$ of Section 30 Township 16 South, Range 8 East (Figure 2). The latitude and longitude have been estimated to be 33° 36' 20" North Latitude and 85° 50' 45" West Longitude.

TOPOGRAPHY AND SURFACE WATER

The site is situated in southeastern Calhoun County in what is considered to be the Weisner Ridges physiographic district of the Alabama Valley and Ridge physiographic section. The Weisner Ridges physiographic district consists mainly of Coldwater and Choccolocco Mountains where altitudes are as high as 2,100 feet. Surface water drainage in this district is mainly into tributaries of the Coosa River (Planert and Pritchett, 1989). The surface elevation at the site is approximately 680 feet MSL.



Surface water drainage from the site (Figure 3) appears to be to the southeast into Choccolocco Creek. Choccolocco Creek consist of the entire 15-mile surface water pathway from the site, and is listed in the ADEM Admin. Code R. 335-6-11-.02 with a use classification of Fish and Wildlife. Choccolocco Creek has a seven day ten year low flow rate of 34 cfs and a seven day two year low flow rate of 53 cfs (Hayes, 1978). No known surface water intakes for public drinking water supplies are located along the 15-mile surface water pathway from the site.

SOILS

The Soil Conservation Service (SCS) classifies soils at the Center Star Manufacturing site as Anniston gravelly clay loam, 10 to 15 percent slopes, severely eroded (Figure 4). The soils in this classification are described by the SCS as areas that were formerly Anniston gravelly loam or Allen gravelly loam that have lost most of their original surface soil through erosion. The surface layer is now a reddish-brown gravelly clay loam that is approximately 4 to 6 inches thick, and is underlain by red or dark reddish-brown gravelly clay loam. These soils are moderate to rapidly permeable (Harlin and Perry, 1961).

GEOLOGY

Consolidated sedimentary rocks that range in age from Cambrian to Pennsylvanian underlie the majority of Calhoun County. These rocks have been sharply folded into a series of northeast trending anticlines and synclines complicated by thrust faults. In the extreme southeastern portion of the county metamorphic rocks of the Piedmont have been thrust up to the northwest and overlie sedimentary rocks of Cambrian and Ordovician age (Moser and DeJarnette, 1992).

The Center Star Manufacturing site is located within the outcrop area of the Cambrian age Shady Dolomite (Figure 5) (Warman and Causey, 1962). The Shady Dolomite is approximately 700 feet thick in Calhoun County and consists of a bluish-gray or pale-yellow thick bedded siliceous dolomite with coarsely crystalline porous chert (Moser and DeJarnette, 1992). Areas underlain by the Shady Dolomite are susceptible to karst formation.

An unnamed fault traverses approximately 0.5 miles to the northwest of the site, the Jacksonville Fault traverses approximately 3.5 miles to the northwest of the site, and the Cartersville Fault traverses approximately 3.5 miles to the southeast of the site. These are thrust faults and generally trend in a northeasterly to southwesterly direction. The structural features in the vicinity of the site (Figure 5) should enhance the fractured nature of the bedrock (Warman and Causey, 1962).

HYDROGEOLOGY

The Center Star Manufacturing site is located within the recharge area for the Valley and Ridge aquifer system, and in the outcrop area of the Shady Dolomite. Groundwater in this formation occurs in interconnected solution channels, and potentially large amounts of water can be obtained from these features. Wells completed in the Shady Dolomite have yielded 69 gpm to 472 gpm (Moser and DeJarnette, 1992). Depth to groundwater at the site measured in temporary monitoring wells ranged from 7.08 feet to 28.8 feet, and shallow groundwater flow at the site is to the south (Bhate, 1998)

There are three active public water supply wells and two test wells located within 4 miles of the site (Figure 6). The closest active public water supply well is operated by the Lee Brass Company, and is located approximately 3.28 miles to the northeast of the site. The other two wells are operated by the city of Oxford and are located approximately 3.37 miles to the southwest of the site and 3.78 miles to the southeast of the site. The two test wells are located approximately 0.9 miles and 2 miles to the southwest of the site. The test wells are currently being developed for public water supply and will be in service in approximately one year. One of the test wells (Eagle Well) has had TCE detected in two samples collected from the well, and the maximum concentration detected to date is 8 ppb (Personal communication with ADEM Water Supply Branch). The site is not in a designated wellhead protection area; however, wellhead protection areas are located within four miles of the site.

CLIMATE

The climate of Calhoun County is characterized as humid subtropical with hot summers, mild winters, and precipitation during all months of the year. The average annual temperature is approximately 62° with an average annual rainfall of approximately 54 inches. The average temperature in the in the summer is 80° and in the winter is 43° (Moser & DeJarnette, 1992). Approximately 19.7 inches of the 54 inches of rain per year runs off into the streams (Harkins, 1972).

cc: Fred Mason, Chief, Hydrogeology Unit
Jymalyn Redmond, Chief, Site Assessment Unit
Larry Norris, Northern Compliance Section

SELECTED REFERENCES

- Bhate Environmental, Inc., September 8, 1998, Report of Limited Groundwater Investigation.
- Harkins, J. R., 1972, Surface-Water Availability, Calhoun County, Alabama: Map 128: Geological Survey of Alabama.
- Harlin, William V., and Perry, E. A., 1961, Soil Survey of Calhoun County, Alabama; United States Department of Agriculture, Soil Conservation Service.
- Hayes, Eugene C., 1978, 7-Day Low Flows and Flow Duration of Alabama Streams Through 1973, Geological Survey of Alabama, Bulletin 113.
- Moser, Paul H., and DeJarnette, S. S., 1992, Ground-Water Availability in Calhoun County, Alabama: To Accompany Special Map 228: Geological Survey of Alabama.
- Planert, Michael, and Pritchett, J. L. Jr., 1989, Geohydrology and Susceptibility of Major Aquifers to Surface Contamination in Alabama; Area 4, United States Geological Survey, Water Resources Investigation Report 88-4133.
- Warman, J. C., and Causey, L. V., 1962, Geologic Map of Calhoun County: Map 17: Geological Survey of Alabama.

GROUNDWATER ROUTE WORKSHEET REQUIREMENTS

Route Characteristics

<u>Aquifer of concern</u>	Valley and Ridge aquifer system
<u>Gross Precipitation</u>	54 inches per year
<u>Net Precipitation</u>	6 inches (from HRS)
<u>Depth to Aquifer</u>	> 30 feet
<u>Slope</u>	10 to 15 percent
<u>Permeability of Unsaturated Zone</u>	1.4×10^{-2} to 4.2×10^{-4} cm/sec.
<u>Is the Site Susceptible to Karst</u>	Yes

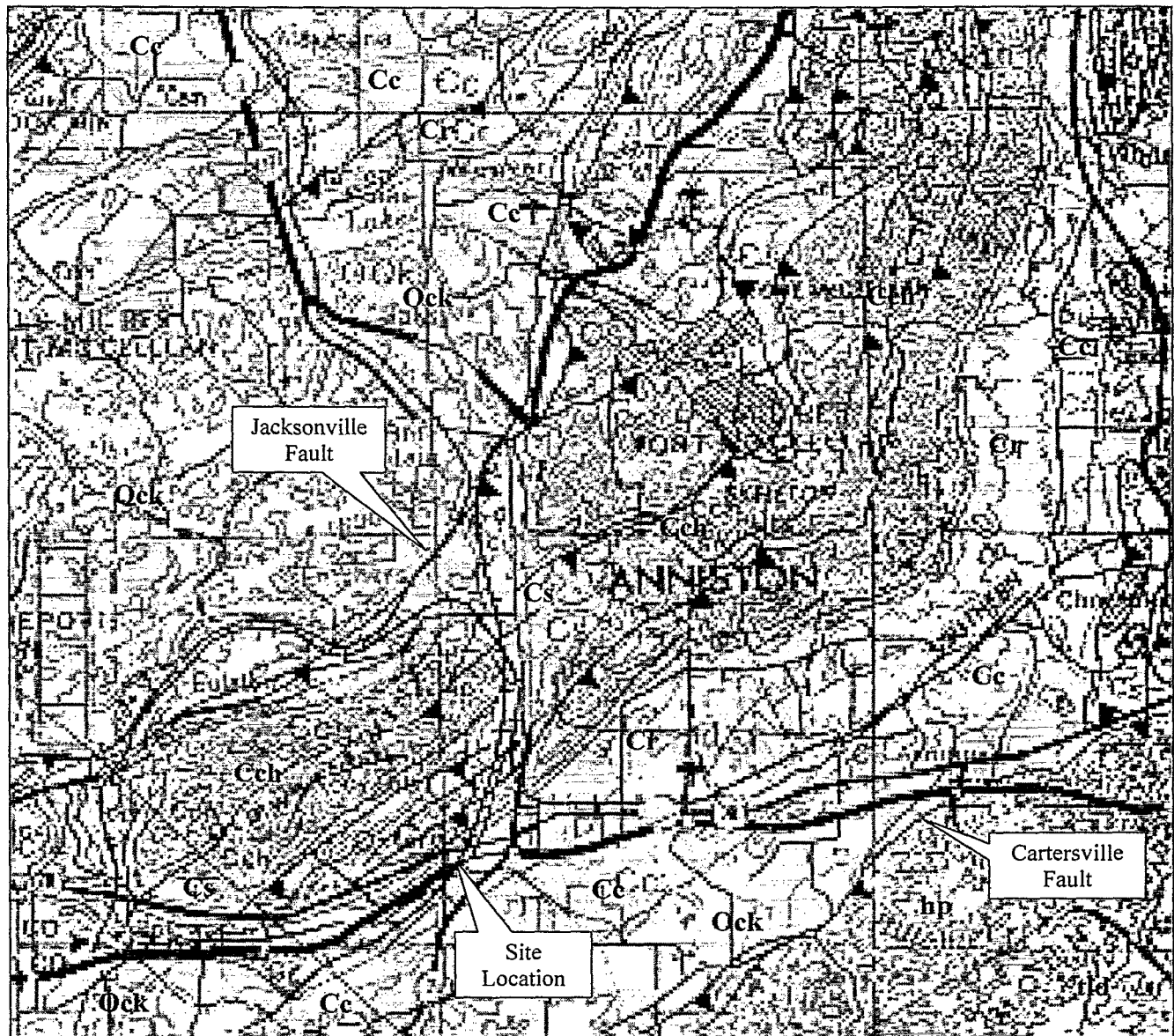
TARGETS

Groundwater use —There are 3 active public water supply wells located within four miles of the site. Two wells that are currently being developed for public water supply are located within four miles of the site. These wells will be in service in approximately one year.

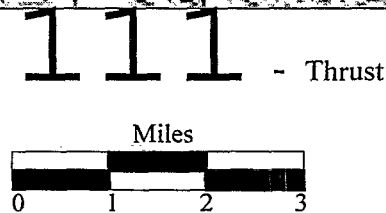
Distance to nearest active public water supply well — Approximately 3.28 miles.

Geologic Units and Structures Near
Center Star Manufacturing, Inc.

17 8 0045



- Ock - Knox Group Undifferentiated
- Cc - Conasauga Formation
- Cr - Rome Formation
- Cs - Shady Dolomite
- Cch - Chilhowee Group
- tld - Lay Dam Formation
- hp - Heflin Phyllite



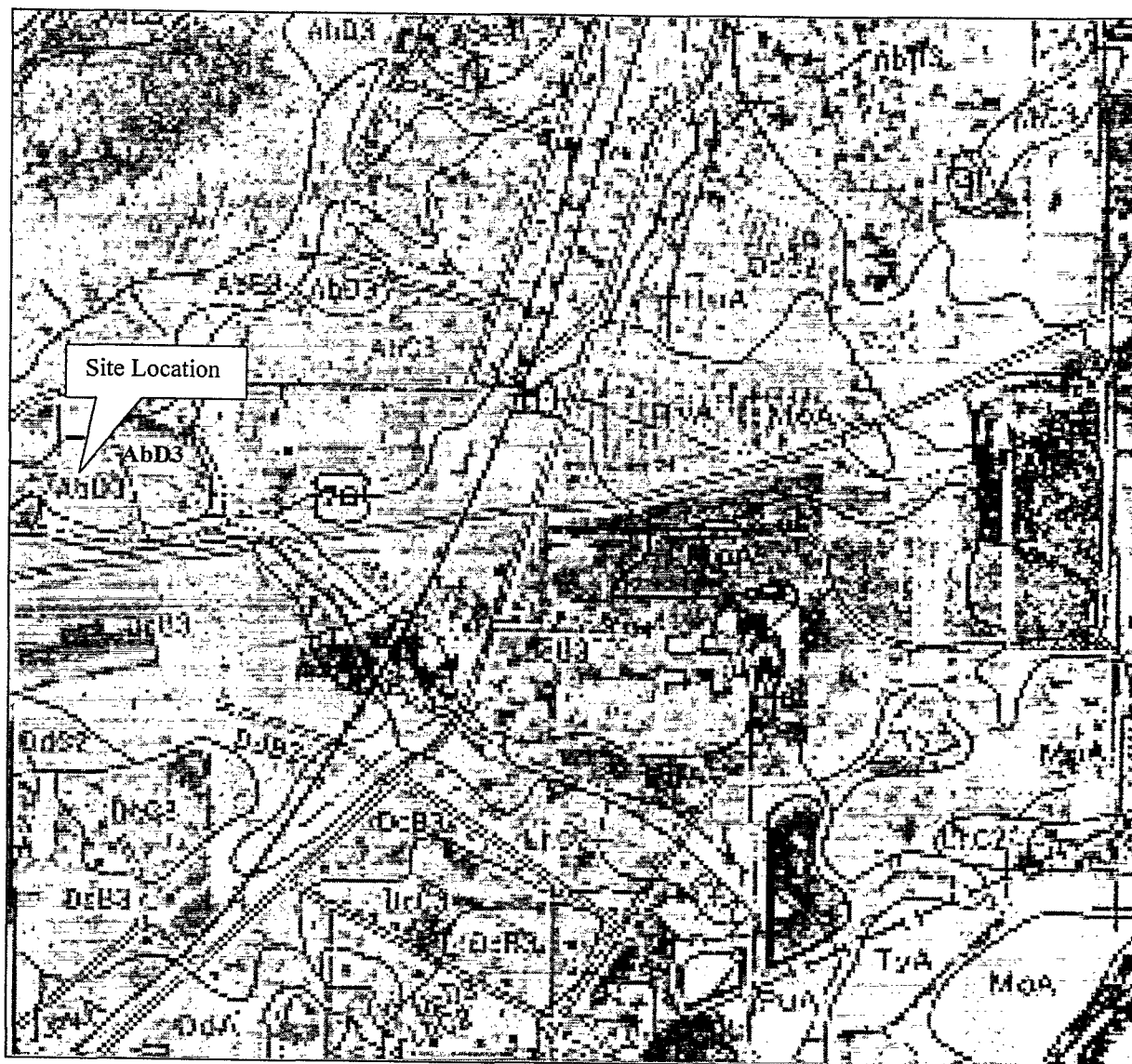
4

Geologic Map of Alabama
Northeast Sheet 1988
W.E. Osborne, Michael W. Szabo, Thornton L. Neathery,
and Charles W. Copeland Jr.
Geological Survey of Alabama Special Map 220

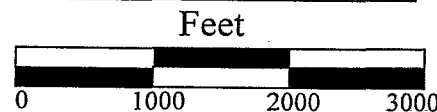
Figure 5

Soil Types Mapped at
Center Star Manufacturing, Inc.

17 8 0046



AbD3 - Anniston Gravelly Clay 10 to 15 % Slopes



U.S. Department of Agriculture
Soil Conservation Service
Calhoun County, Alabama
Sheet # 36

4

Figure 4

Center Star Manufacturing, Inc.

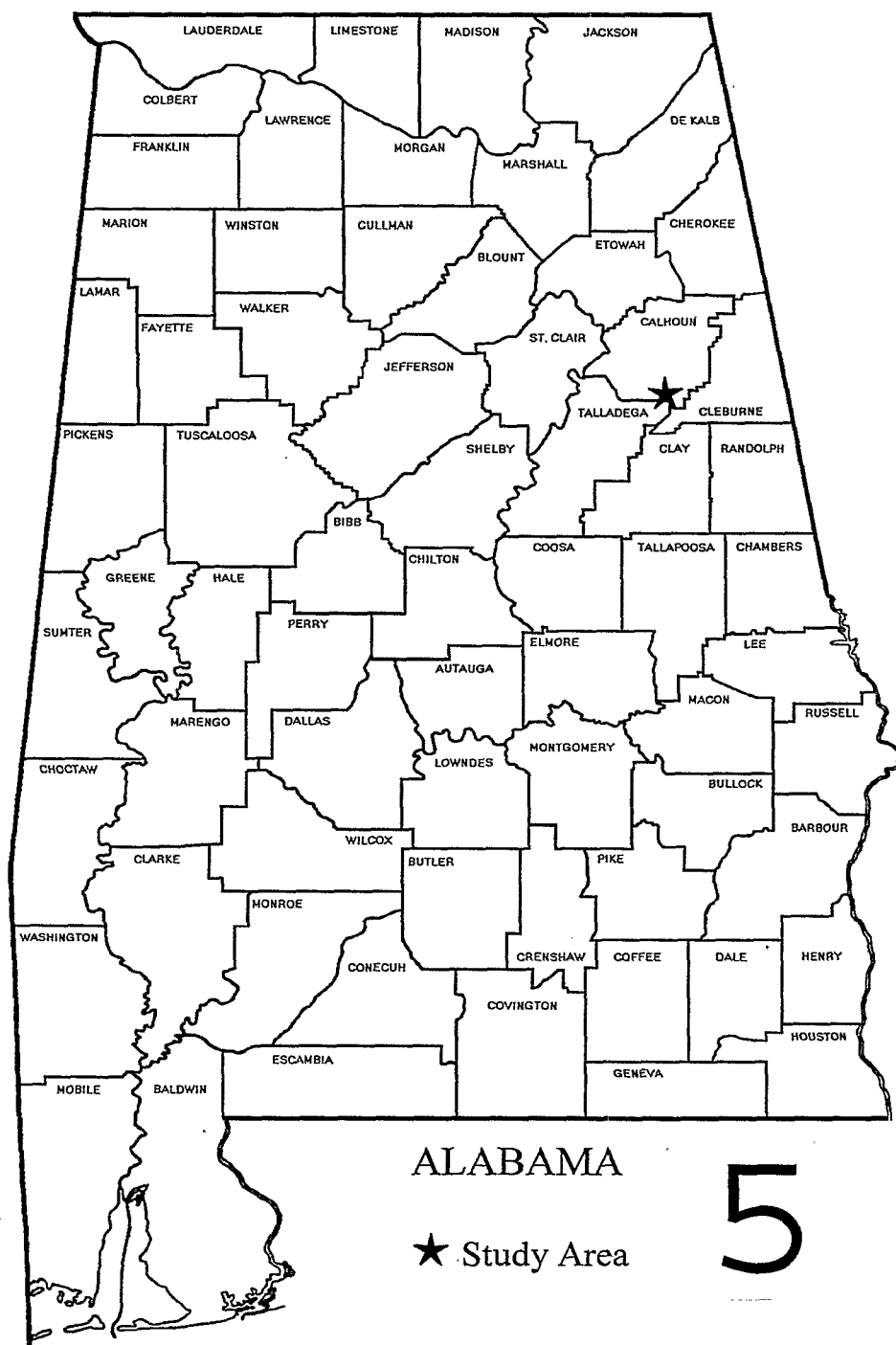
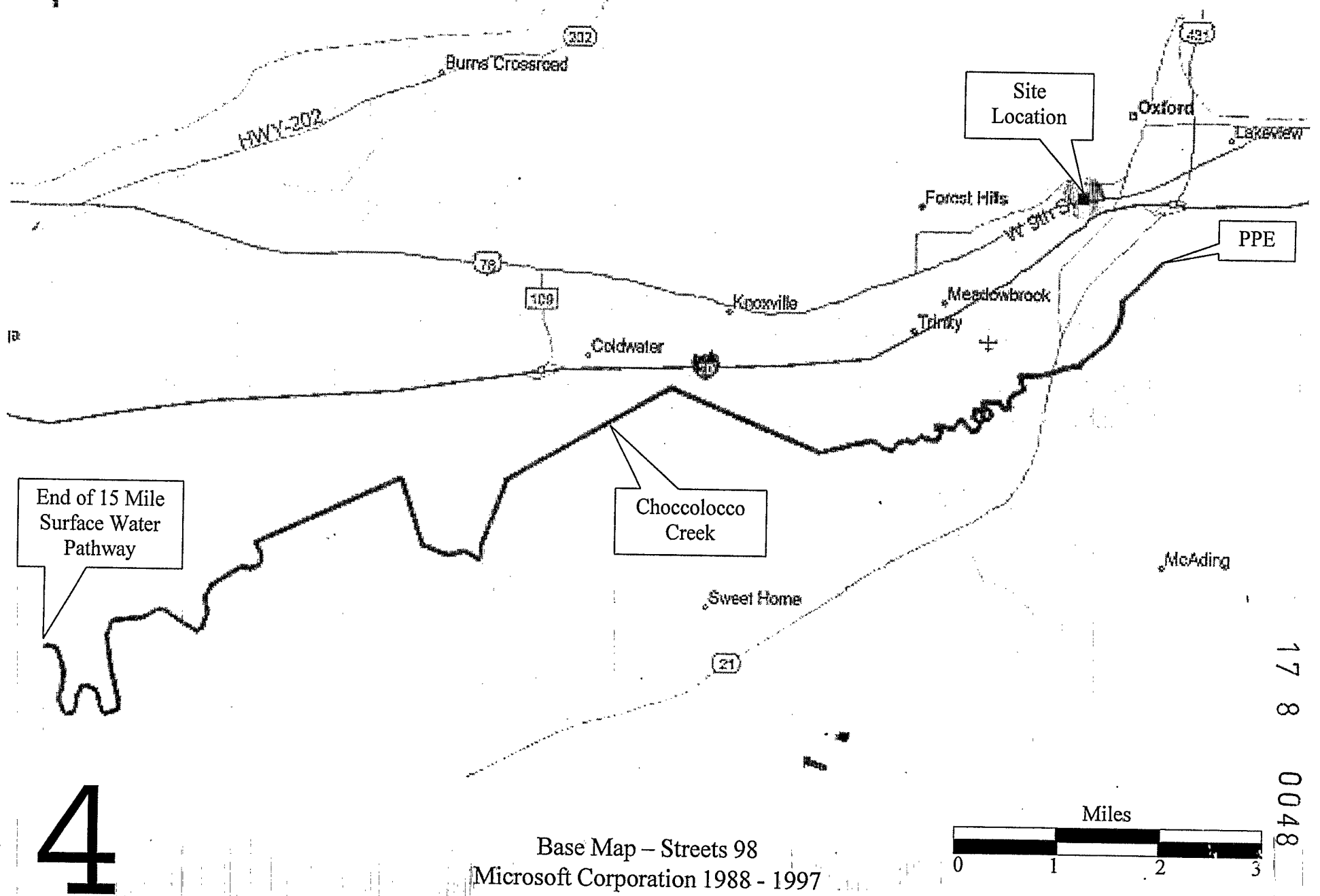


Figure 1

15 Mile Surface Water Pathway Center Star Manufacturing, Inc.



4

Base Map – Streets 98
Microsoft Corporation 1988 - 1997

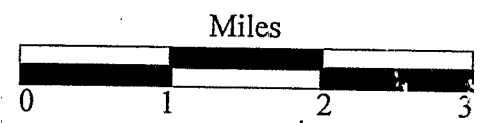
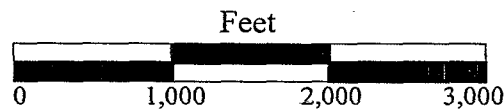
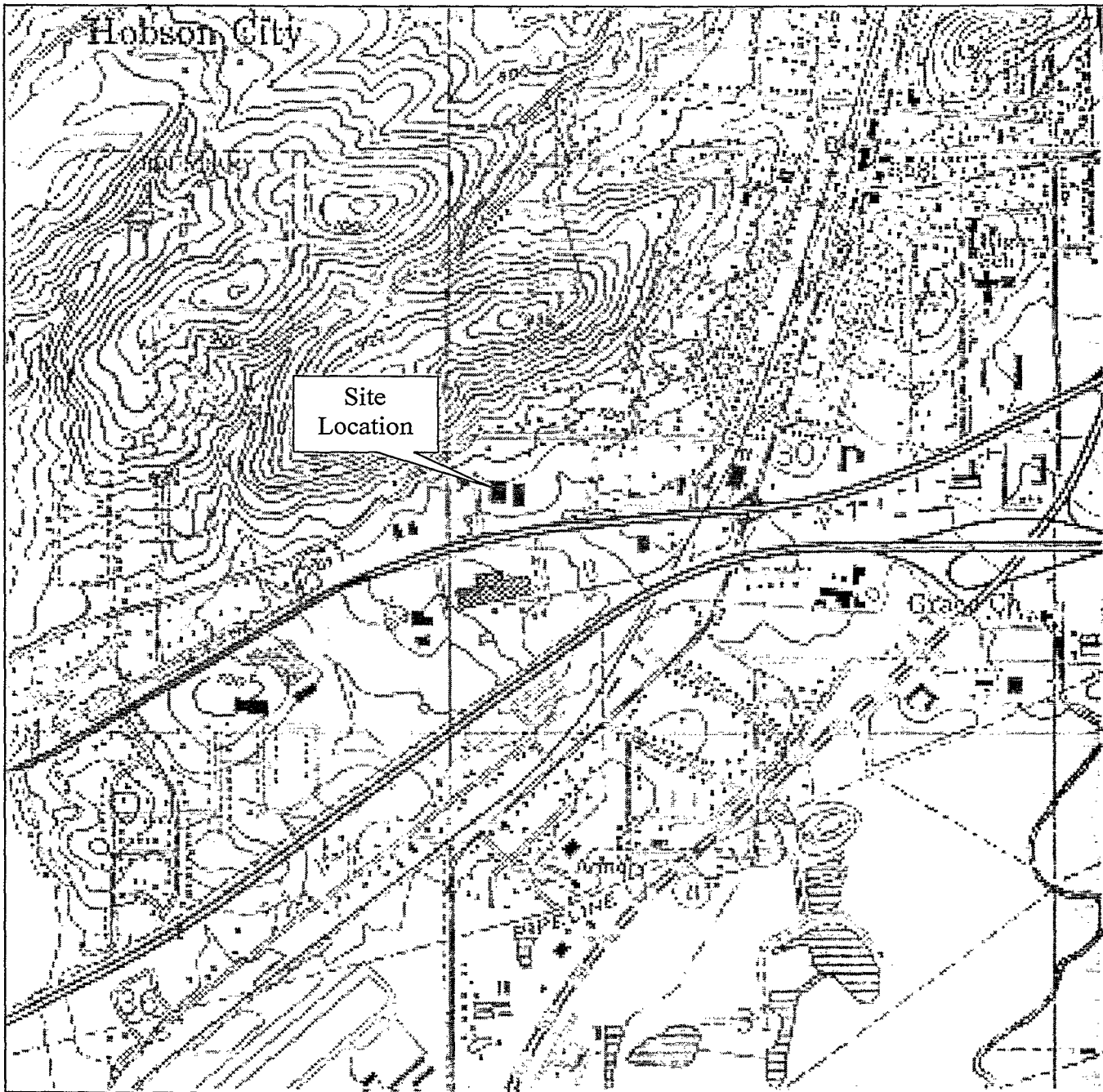


Figure 3

17 8 0048



Center Star Manufacturing, Inc.
Oxford, Calhoun County, Alabama

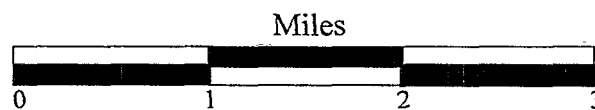
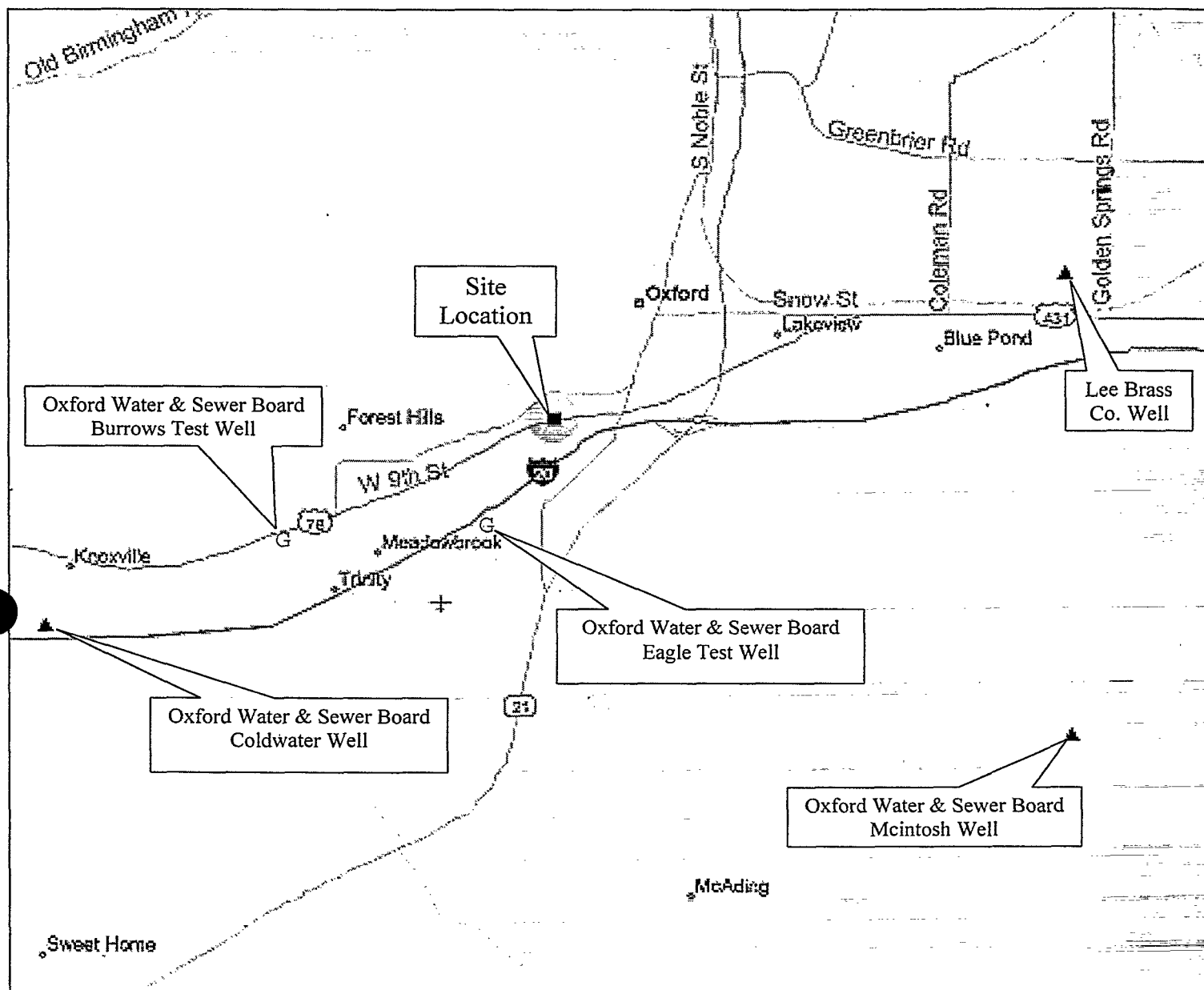
Oxford, Alabama
U. S.G.S. Topographic Map 1956
Photo Revised 1983

Figure 2

4

Public Water Supply Wells in the Vicinity of Center Star Manufacturing, Inc.

17 8 0050



Base Map – Streets98
1988-1997 Microsoft Corporation
Well Information – ADEM GPS Data

Figure 6